Lawrence Livermore National Laboratory

November 29, 1995

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For: 1996 International Hazardous Material Spills Conference:

TOPIC AREA: New Technologies in Response (also could include Case Studies)

PROPOSED TALK TITLE: The Department of Energy's Atmospheric Release Advisory Capability (ARAC) Real-time Dispersion Modeling System for Hazardous Releases

NATURE OF THE TALK: For 20 years, the Atmospheric Release Advisory Capability (ARAC) program at Lawrence Livermore National Laboratory (LLNL) has supported the Departments of Energy (DOE) and Defense (DoD) in response to disasters involving major hazardous releases into the atmosphere. Traditionally ARAC has prepared for and responded to incidents involving nuclear facilities and agencies. However, the program has also been called to model non-radiological incidents such as toxic chemical spills (Richmond, Calif. oleum spill in 1993), fires (the Kuwaiti oil fires in 1991), and volcanic ash clouds (Mt. Pinatubo in 1991). In many instances ARAC has responded requests from states as approved by the DOE. The program can produce a timely consequence analysis anywhere in the world. ARAC acquires real-time meteorological data worldwide, determines the appropriate source term, runs a complex 3-D numerical dispersion model with terrain effects, and produces a plot of the extent of the hazard on local (1-10 km) to regional scales (10-1000 km). Employing a high degree of automation with over a million lines of code and using extensive on-line databases, the system can deliver plots to an emergency response manager in less than 15 minutes at sites with predetermined default scenarios. The ARAC Center is staffed to operate 24-hours / day on an on-call basis. In 1996 ARAC will implement chemical spill source term models to automate responses to industrial accidents. Plans also include adding prognostic models to forecast meteorological conditions up to 36 hours into the future for extended incidents.

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